Sinter Box and Sinter Simulator

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Corus's Teesside Technology Centre has two facilities available for production of small quantities of test sinters:

First, the sinter box is a rectangular unit with a gas-fired ignition hood. To avoid heat loss effects at the edge of the unit, it is normally operated with a cylindrical insert (internal dimensions 500 mm diameter by 300 mm depth) It can produce sinter to a specified blend or final chemistry, in batch sizes of approximately 50 kg, which is sufficient to ensure many of the standard burden tests can be carried out (see separate leaflet for details of the burden testing facilities).

The facility can be used to observe the effects of changes to the sinter blend, whether it be a substitute ore (perhaps a cheaper ore), or a new brand or any of the other components such as lime, dolomite, coke breeze, recovered waste materials (ie BF slurry). Variations to the ratios of materials in the blend can then be compared with each other and other "standard " sinter blends.

Second, the sinter simulator produces very small samples of sinter, about 0.5 kg. It is fitted with a nitrogen quenching facility, allowing the test to be interrupted at any point during the sintering process. The partially sintered sample can then be preserved intact for further study by embedding in epoxy resin.

This facility is suitable for producing samples where there is a very limited quantity available of the material to be tested, or where only a small quantity of finished sinter is required. It is also used for fundamental studies of the sintering process. The small volume gives a high throughput of samples, and the simulator is a particularly cost-effective way of running a large number of tests where only a small quantity of finished sinter is needed.

The main benefits gained from using these facilities are:-

- allows testing of a whole range of ore blends without effecting the current sinter plant operations
- optimisation of blends, taking account of recirculating loads, chemistry, volume etc.
- provides valuable information on productivity and fuel rates that can be expected if given blends were to be used on the production plant
- defines sinter plant operating parameters for the blends, such as burn-through rate, flame-front speed, waste gas volumes (from LOI)
- samples can be further tested for their suitability in blast furnace operations (ie. drop and shatter tests, reducibility, chemistry, high and low temperature breakdown tests).